BOOK REVIEWS

PROGRESS IN ELEMENTARY PARTICLE AND COSMIC RAY PHYSICS—Vol. VII, 1963. Edited by J. G. Wilson and S. A. Southuysen. Contributor: L. I. Dorman. Published by North-Holland Publishing Company, Amsterdam.

It is a single article by the Russian physicist L. I. Dorman of the Lebedev Physical Institute, Moscow. It contains an exhaustive accounts of general literature on Cosmic ray investigations covered upto the end of 1960 and publications in Russian upto the end of 1961.

In this volume, the contributor discusses the results on the primary Cosmic ray variations from the measurements of the secondary components over appropriate ranges of latitudes and describes exhaustively on the effects of Cosmic ray measurements of solar injected streams. All the established cosmic ray intensity variations are discussed with ample reference to published literature, especially during the I.G.Y. In particular, he has given a diagnostic interpretation of the "Forbush decrease" in terms of the Cosmic ray profile and in relation to the solar stream.

The introduction is followed by a description of the effects of the atmospheric and geomagnetic field on primary Cosmic radiation in second and third chapters. The fourth chapter deals with the time variations in Cosmic ray intensity and their theoretical interpretation in terms of the electromagnetic conditions in interplanetary space. Particles with energies between 10^9 and 10^{18} e.v. bombard the solar system with a practically isotropic intensity constant in time, but the number of low energy particles penetrating the weak fields in interplanetary space varies with the 11-year solar cycle. The last two chapters are concerned with the acceleration of Cosmic rays by the Sun, and possible anisotropics in the flux of particles from the galaxy. The last chapter, in particular, discusses the long term variation of the Cosmic ray intensity and the apparent 22-year variation.

Not unexpectedly, there is a heavy emphasis throughout this volume on the results and achievements of the Soviet investigators. However, a fairly comprehensive list of references is provided at the end of the volume.

Covering such a wide range of topics and spanning several years of investigations, especially over the past decade, this volume deserves the attention of Cosmic ray and Astrophysicists in general and other investigators in allied branches of Geophysics and Plasma physics.

S.D.C.

ELEMENTS OF PHYSICAL CHEMISTRY—by Samuel Glasstone and David Lewis. Macmillan & Co. Ltd. (1962), Papermac, Price 25s.

The book is practically a revised version of 'Elements of Physical Chemistry' by Glasstone. It differs from the previous one in ordering of chapters, relative emphasis on different topics, and new set of problems and reading references. On the whole the changes have been for the good. The language is clear, straightforward and precise, and unnecessary descriptive details have been avoided. The book will serve as a good text book for Honours undergraduates.

The ordering of chapters, however, is hard to understand. The philosophy with which the authors have approached the subject has not been made clear.

I think that elementary deductions of some basic equations of fundamental importance (such as Maxwell-Boltzman distribution law, Debye equation for dipole moment, Debye-Huckel Theory of strong electrolytes) display to the students the types of thought that played a part in development of Physical Chemistry. These deductions have been omitted in the book. Some elementary non-rigorous deduction could have been given just to enable the students to see how these results were arrived at.

According to the authors themselves Physical Chemistry is 'concerned with the elucidation or clarification of the principles underlying those transformations of matter known as chemical reaction'. This aim, however, could not be fully achieved in the book due to inadequate discussion on Quantum Theory. An explanation of chemistry can be achieved only from Quantum mechanics, which has been responsible for giving birth to most of the modern ideas in chemistry. The historical background and the reasonings by which Planck arrived at Quantum Theory could have been indicated, and the application of Schrödinger equation to a few simple cases could be discussed (as done by Moore, for example). The authors have not tried to explain the change of physical properties with change in molecular architecture, which is one of the main aims of Physical Chemistry.

Apart from these minor points, the book is well balanced and well-written and will serve its purpose as a text book for Honours undergraduates.

M.C.